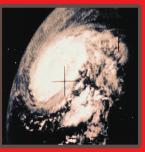
The Official Coastal Bend

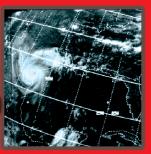
Hurricane

Survival Guide Beulah



It only takes one!

Celia



1999



2003 Claudette











Alberto Helene Beryl Isaac Chris Joyce Debby Kirk **Ernesto** Leslie Florence Michael Gordon **Nadine**

Oscar **Patty** Rafael Sandy Tony **Valerie** William

Welcome

Our nation is in the midst of the most active hurricane episode on record in the Atlantic hurricane basin. Science indicates that this may persist for another decade or longer. The mid Texas coast has not experienced a direct assault from a major hurricane in 36 years, when Hurricane Celia crossed our coast line in 1970. However it is not a matter of if, but when the next storm will make landfall and change our community forever.

Coastal residents are at risk from the hurricanes' deadly storm surge and destructive winds but often do not realize it. There are simple, cost effective measures every citizen can take to mitigate their losses from a hurricane. For these reasons, your local National Weather Service office in Corpus Christi, along with several key partners, found it imperative to develop this comprehensive Hurricane Guide for our Coastal Bend community.

This Hurricane Guide will serve as your robust roadmap for action before, during and after the hurricane season. It is very important to plan accordingly to meet your personal and family needs. In this manner, we are all working together for a safer and prepared community.

Sincerely,

Scott C. Cordero

Meteorologist-In-Charge National Weather Service Corpus Christi, TX Serving and Protecting South Texas Since 1887

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Storm In The Gulf Final Preparations (pages 16-17)

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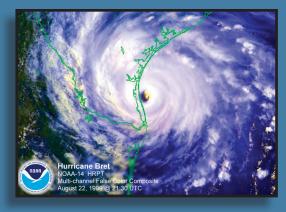




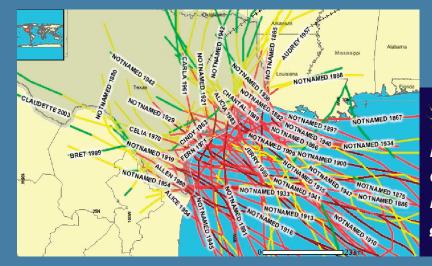


About Hurricanes

urricanes form over warm ocean waters, like those found in the Gulf of Mexico. The hurricane season starts on June 1 and extends through November 30. The peak threat for the Texas coast exists from August through September. However hurricanes can and have struck the Texas coast during every month of the hurricane season.



Satellite image of Hurricane Bret on August 22, 1999.



Fifty-five hurricanes have struck the Texas coast since 1851. That is one every 3 years on average.

Definitions To Know

- Tropical Depression An organized system of persistent clouds and thunderstorms with a closed low-level circulation and maximum sustained winds of 38 mph or less.
- **Tropical Storm** An organized system of strong thunderstorms with a well defined circulation and maximum sustained winds of 39 to 73 mph.
- **Hurricane** An intense tropical weather system with a well defined circulation and sustained winds of 74 mph or higher.

- **Tropical Cyclone** A general term used to describe a tropical depression, tropical storm, or hurricane.
- Hurricane/Tropical Storm Watch Hurricane/Tropical Storm conditions are possible in the watch area within 36 hours.
- Hurricane/Tropical Storm Warning -Hurricane/Tropical Storm conditions are expected in the warning area within 24 hours.

<u>Storm Surge</u>

Storm surge is a dome of water often 50 to 100 miles wide that sweeps across the coastline along and to the right of where the eye crosses the coast. In general, the stronger the winds in the hurricane, the higher the storm surge. If the hurricane makes landfall during high tide, the impact will be even greater.

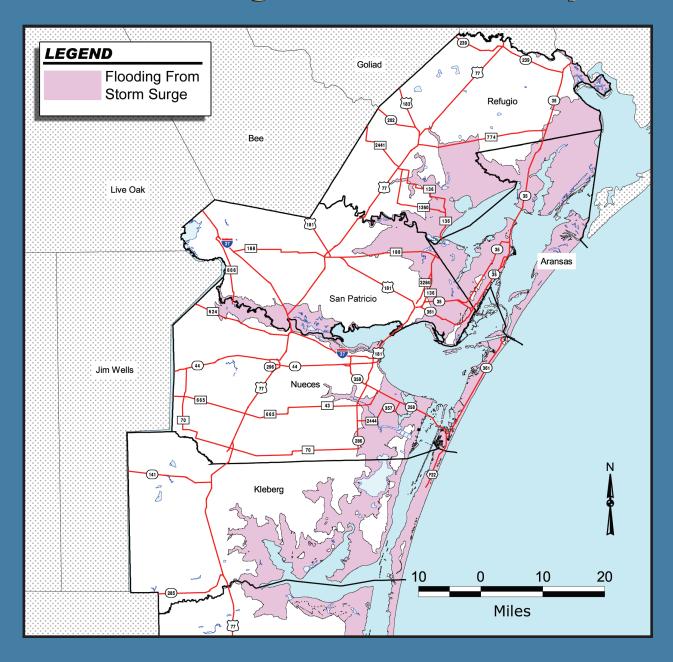
Historically, storm surge has been responsible for 9 out of 10 hurricane fatalities.



Storm Surge Facts:

- The 1919 Hurricane that impacted Corpus Christi produced a storm surge 16 feet high and killed 284 people.
- Hurricane Carla in 1961, generated a 22 ft. storm surge at Port Lavaca.
- Hurricane Celia in 1970, generated a 11 ft. storm surge at Aransas Pass.
- The Great Galveston Hurricane in 1900 killed 8000 people, most by storm surge.

Storm Surge Inundation Map



This worst case scenario map illustrates the potential inland penetration of a Category 5 Storm Surge (\pm 20% accuracy).

For more information check www.srh.noaa.gov/crp

Wind

urricane Force winds of 74 mph or more can destroy buildings, mobile homes, trees and power poles. Debris, such as signs, roofing material, siding, and small items left outside, become flying missiles in a hurricane. The strongest winds occur in a region of the hurricane called the eyewall. Wind gusts in the right side of the eyewall are the most destructive. Hurricane force winds can be felt as far as 150 miles inland from the coast.

It is imperative to ensure your home, or business is well constructed to minimize the damage from the wind. See page 8 in this guide for cost effective home improvement tips that can help you reduce your damage from a hurricane.



A category 4 hurricane will cause about 100 times the damage of a category 1 storm

Wind Facts:

- Hurricane Celia produced sustained winds of 125 mph and gusts to 161 mph in Corpus Christi causing extensive damage to buildings across the city.
- Hurricane Celia generated hurricane winds as far inland as Del Rio.

Saffir-Simpson Hurricane Intensity Scale

category 1	minimal damage	74 mph to 95 mph
category 2	moderate damage	96 mph to 110 mph
category 3	extensive damage	111 mph to 130 mph
category 4	extreme damage	131 mph to 155 mph
category 5	catastrophic damage	156+mph

<u>Inland Flooding</u>

looding from tropical cyclones is a major threat to people well inland from the coast. Very slow moving tropical storms and hurricanes can produce tremendous rains of 20 to 30 inches or more, resulting in disastrous flooding.



In the last 30 years, inland flooding has killed more people than any other weather hazard related to tropical cyclones.

In 1967, Hurricane Beulah produced tremendous floods across South Texas, killing 39 people.

Tornadoes

I ropical cyclones can produce tornadoes adding to the storm's destructive power. Tornadoes are most likely to occur in the right front quadrant of the tropical cyclone in the eyewall region or in the outer rainbands as far as 150 miles away from the center. The tornadoes are usually weak and short-lived, but still pose a threat to life and property.



Photo by Anna Chapa

Tornado Facts

In 1988 Hurricane Gilbert made landfall well south of Brownsville, yet spawned 29 tornadoes in South Texas, 13 in San Antonio alone, causing \$50 million in damage.

Hurricane Beulah (1967) holds the record for the most known tornadoes to be spawned by a tropical system. It is estimated that Beulah produced over 114 tornadoes across South and Central Texas.

Preparing Your Property

Preparing Your Home:

Landscaping: Replace gravel/rock landscaping with shredded bark.

Keep trees and shrubbery trimmed. Cut branches and trees that could fall or bump against the house.

Windows: Cover all large windows and patio doors with securely fastened storm shutters made from 5/8" thickness plywood or greater. Or install tested / manufactured hurricane shutters.

Doors: Reinforce the double-entry doors with heavy duty foot and head bolts, and use a security dead bolt lock with one inch minimum bolt throw length.

Reinforce double garage door and tracks. Or Replace double garage door with hurricane wind load tested garage door.

Roof: If you find that the roof decking is not adequately attached: Use adhesive to attach the decking to the rafters. If re-roofing, use extra 8d (8 penny) nails or #8 screws. Also, install roof covering shingles that are rated for hurricane force winds based on the manufacturer's recommendations; Apply additional adhesives as needed.

Brace gable end walls and roof trusses inside attic. Install hurricane clips/straps connecting roof rafters/trusses to the side walls.

Walls: Check to see if the exterior walls are connected to the foundation properly if you have a wood frame house.



Keep trees trimmed.



Brace garage doors from behind.



Strengthen your roof by using hurricane clips.



Insurance Tips

Pre-storm Prepa	rations - Are	you ready for	Hurricane Season?
-----------------	---------------	---------------	--------------------------

	Before hurricane season begins, take time to meet with your local insurance agent to determine if your property and belongings are adequately protected.
	It would be a good idea to make a detailed inventory of all your belongings. A photographic record of all items is very valuable when it comes to fast settlement of claims.
	Obtain protective coverings for windows and garage doors. Purchase hurricane shutters, precut plywood or laminated glass. Give yourself plenty of time to install these before the hurricane arrives.
	Garage or store vehicles you plan to leave behind.
	Moor boats securely or place inside a building.
	If you have a manufactured home, check tie-downs.
Afte	r the Disaster - What should you do?
	Take any necessary measures to protect and dry out your building.
	Dispose of damaged property which presents a health hazard or which may hamper local clean-up operations. Be sure to adequately document discarded items by saving your receipts, photographing the items and by compiling a room-by-room inventory of missing or damaged goods.
	If you perform any of the clean-up activities yourself, consider your safety and the safety of others in performing these tasks.
	Do not dispose of any large dollar items that are damaged, such as large televisions and furniture, until authorized by your claim representatives, as this property may need to be inspected. Move personal property to a protected area.
	If there is a lot of water inside your home, remove the water and wet items. Try to leave it as well ventilated as possible to help in the drying out process.
	Handle antiques, art objects, sterling and brass with special care. You can dry them, but do not oi or rub them since this could damage finishes or surfaces.
	Clean and dry wood furniture as soon as possible. Be careful not to rub in abrasives such as soil o plaster that may have fallen on the surfaces.
	Try to dry bedding and upholstered furniture that is saturated with water. Don't store other possessions near these items.
	Dry and clean any carpet or rug that has minor water damage.
	To prevent corrosion of metal objects, dry and rub or spray with oil.
	Dry, but don't oil radios, televisions and other electric devices. Have all electrical equipment exposed to water professionally serviced before using them.
	Caution! Do not attempt to start a flood-damaged car before it has been inspected as this may cause additional engine damage.

Special Needs

General Preparations

Preparation in advance of hurricane season is essential, especially for people with special needs. Shelters should be considered a *last resort* in your evacuation plans because many cannot accommodate people with special needs or provide the attention you may require. Therefore, it is important to have a plan in place. You are encouraged to assist your elderly neighbors and acquaintances with pre-storm preparations.



Important Preparation Tips

- ☐ Identify with whom you will stay in ☐ The following is a list of some items the event an evacuation is necessary. that could be stored in advance:
- Make arrangements for transportation in the event you evacuate. Make sure your transportation can accommodate any equipment or other supplies that need to be taken with you.
- ☐ Extra copies of your prescriptions in case your physician's office is damaged and not operational.
- □ At least a one-month supply of medications.
- ☐ Identification.

Source: University of Miami Leonard M. Miller School of Medicine

Preparing For Your Pet's Safety

DO's: DONT's:

- ☐ Take your pet with you when you evacuate.
- Make sure your pet has a proper
 ID collar.
- ☐ Take a pet carrier and leash for each animal.
- ☐ Make sure all of your pet's vaccinations are current and have proof.
- □ DO NOT allow your pet to eat or drink food from outside that may have become contaminated.
- □ DO NOT assume a public shelter, hotels or motels will accept your pet.

Preparations



he Coastal Bend - Texas Chapter of the American Red Cross recommends that you have these items in your Emergency Disaster Supply Kit. Don't forget to

have a family meeting and review the information, your emergency plan, and update your communication plan; including home, work, school, and cell phone numbers as well as your "Out-Of-Town" contact person's number.

List Your Important Contact Information Here:				
	_			

Emergency Disaster Supply Kit

☐ 7-day supply of non-perishable food	☐ CD or photocopies of important documents
and a manual can opener. (can tuna, beans,	(titles, mortgages, birth & marriage
granola bars, pet food, etc.)	certificates).
☐ 7-day supply of water (one gallon per	☐ Cash and coins.
person, per day and one-half gallon per pet,	
per day.).	Special needs items such as prescription
☐ Portable, battery-powered radio or	medications, eye glasses, contact lens solution, and hearing aid batteries.
television and extra batteries.	Solution, and hearing aid batteries.
☐ Flashlight and extra batteries.	☐ Infant items, formula, baby food, diapers,
E First Aid life and annual	and pacifiers.
☐ First Aid kit and manual.	A good Toyos Man showing county roads as
☐ Sanitation and hygiene items (hand	☐ A good Texas Map showing county roads as well as highways.
sanitizer, moist towelettes, and toilet	well as flighways.
paper).	☐ Toys/Games for the children.
☐ Matches in waterproof container.	☐ Pet Carriers and leashes for each animal
□ Whietle	evacuating with you.
☐ Whistle.	Tire repair bit beester/lumner cables
☐ Extra clothing, blankets, and sleeping bags.	☐ Tire repair kit, booster/Jumper cables, pump and flares.
☐ Kitchen accessories and cooking utensils.	
	☐ White Distress Flag.
☐ Photocopies of identification, insurance,	☐ List of family phone numbers and addresses
prescriptions, household inventory, and credit	outside the area.
cards.	outside the dreat

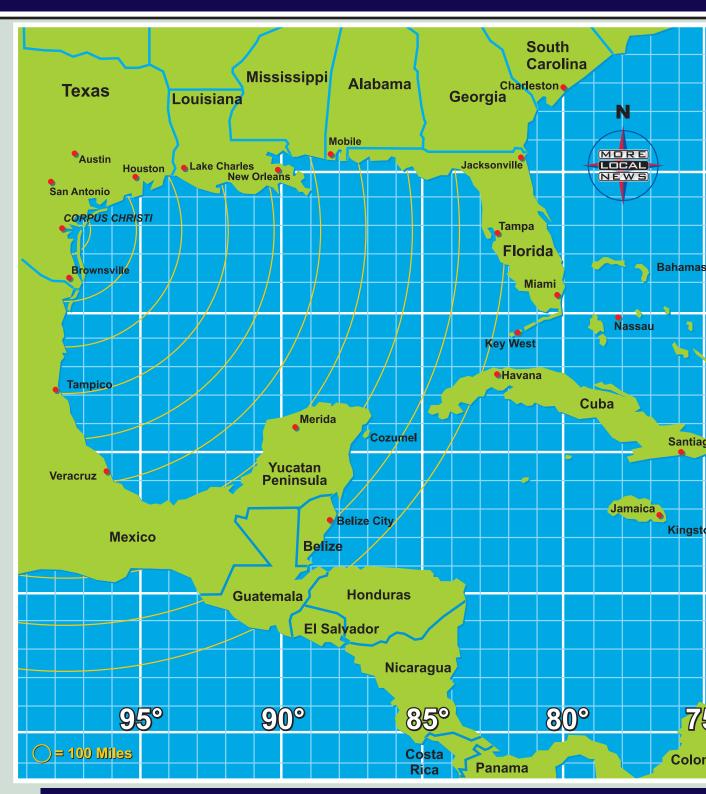
For More Information:

361-887-9991

www.cbtredcross.org

Alberto Beryl Chris Debby Ernesto Florence Gordon Helene Isaac Joyce Kirk

Hurricane Tr



This Chart is marked with vertical (longitude) and horizontal (latitude) lines, each represent number at the bottom of the chart. Follow it up where it intersects with the given latitudinal

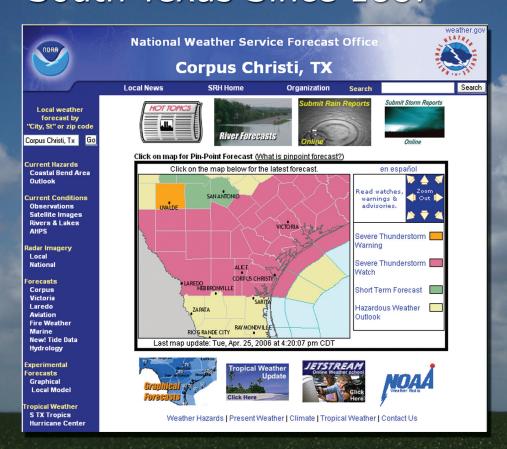
Leslie Michael Nadine Oscar Patty Rafael Sandy Tony Valerie William

racking Chart



senting 1 degree. A storm's position is given in these degrees. Find the given longitudinal dinal line. Place a mark on the intersection point (this is the hurricane's current position).

Your National Weather Service Serving and Protecting South Texas Since 1887



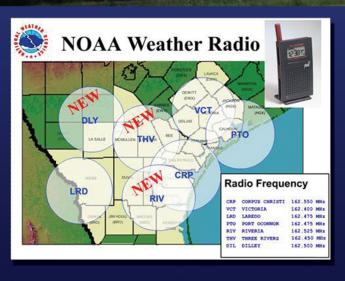


Complete weather information at you fingertips 24 hours a day 7 days a week.

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- * Watches
- * Advisories
- * Marine Weather
- * Tropical Weather
- * Forecast
- * Current Conditions

www.srh.noaa.gov/crp

361-289-0959





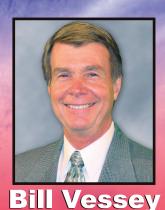
3NEWS

WHEN THE WEATHER IS AT ITS WORST, WE'RE AT OUR BEST!



Steve Jacobs Six and Ten

Chief Meteorologist 20 Years Of Weather Forecasting Experience



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- **Exclusive Genesis Weather Forecasting Technology**
- Round The Clock Coverage When A Storm Threatens

24HR WEATHER INFO LINE:

814-WIND







A Storm Is Brewing

The National Hurricane Center (NHC), Storm Prediction Center (SPC), Hydrologic Prediction Center (HPC) and local Weather Forecast Offices (WFO) all work together to provide the best possible hurricane forecasts as well as expected impacts in the local area. This information is available through the internet, NOAA weather Radio, and local media outlets.

Need Weather Information?

National Weather Service (NWS)
www.srh.noaa.gov/crp

National Hurricane Center www.nhc.noaa.gov

NWS 24-Hour Phone Recording (361) 289-1861

KIII Weather Line 814-wind

Understanding The Hurricane Forecast



The National Hurricane Center produces a 5 day forecast for tropical depressions, tropical storms and hurricanes. The black line and dots on the graphic show the forecast track for the eye of the storm. The white cone represents the forecast uncertainty. Although hurricane forecast tracks have improved significantly in the last 20 years, hurricane forecasts are not perfect. When interpreting the forecast, understand that the center of the tropical cyclone will remain within the white error cone only 67% of the time! It is also important to note that hurricane conditions can spread hundreds of miles from the center.

Do's And Don'ts Of Using The Hurricane Forecast

DO begin to implement the final preparations portion of your hurricane plan if you live in an area which falls within or near the cone of uncertainty.

DO keep up with the latest National Hurricane Center forecast. These are updated four times a day.

DO NOT focus solely on the exact forecast track because the hurricane's movement can be erratic and difficult to forecast.

DO NOT wait for a hurricane watch or warning to begin implementing your final preparations as it may be too late to complete them.

final preparations

Final Checklists

Actions To Take When Storm Is In The Gulf

- ☐ Listen for official bulletins on local television, radio, and NOAA weather radio.
- ☐ Fill your vehicle's tank with gas and check fluid levels.
- □ Obtain adequate supply of prescription medicines.
- ☐ Get extra cash.
- ☐ Double check your Disaster Supply Kit.
- ☐ Bring in outdoor objects such as lawn furniture, toys, garbage cans, potted plants and garden tools.
- ☐ Board up windows. **Do not use tape**.
- □ Follow in structions issued by local officials.
 EVACUATE IMMEDIATELY IF ORDERED
 TO DO SO.

Final Actions If Leaving

- ☐ Turn off utilities if ordered to do so and turn main switch for the electricity to off.
- ☐ Turn off propane tanks.
- ☐ Unplug small appliances.
- ☐ Completely empty your refrigerator and freezer.
- □ Lower the water level in swimming pools by a foot to allow for heavy rains.
- ☐ Take pets with you.
- ☐ Notify family members or other contact outside of the warned area of your evacuation plans.
- ☐ Lock home securely.
- ☐ Board up doors and brace garage doors.



Hurricane Rita entering the Gulf of Mexico.

Final Actions If Staying

- ☐ Make sure you have all the supplies necessary to survive on your own for a week or longer.
- ☐ Do not expect emergency responders to be of any assistance during a hurricane landfall.
- ☐ Turn refrigerator and freezer to their coldest setting and only open when necessary.
- ☐ Turn off utilities if ordered to do so.
- ☐ Board up doors and brace garage doors.
- ☐ Stay inside your home at all times during the storm and away from windows and doors even if they are covered.
- □ Take refuge in a small ground floor, interior room, closet, or hallway. Take a battery-powered radio, a NOAA Weather Radio, and a flashlight with you.

Evacuations

Evacuees need to consider the travel path of the hurricane and your destination in choosing evacuation routes. Listen to local authorities and emergency broadcasts about weather and highway conditions.

Need Road Information?

TXDOT Road Conditions
1-800-452-9292
TXDOT Corpus Christi Office
1-361-808-2300

Listen to Emergency Broadcast Information

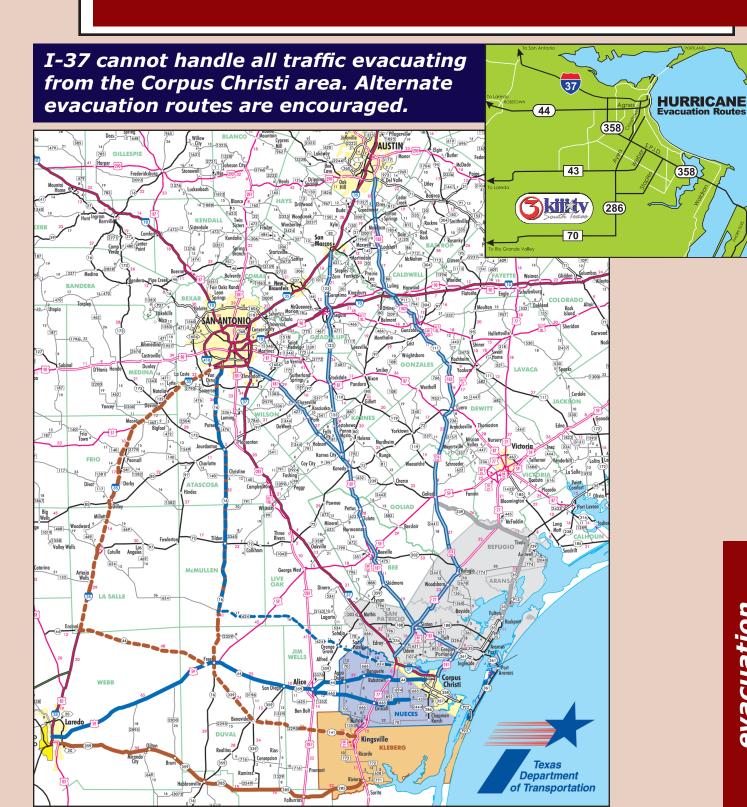


It takes between 18 and 30 hours to evacuate the coastal counties in advance of tropical storm force winds.

- Follow evacuation orders provided by your local officials. Once the evacuation order has been given, leave immediately.
- ☐ Take your portable supply kit with you (as described by the Red Cross on page 11).
- Leave as early as possible to avoid heavy traffic and hazardous weather.
- See TXDOT map on the next page for an illustration of primary and alternate evacuations routes. Remember primary routes can become congested.
- Do not stay in a mobile home near the coast under any circumstance.
- Remember large boats and travel trailers may not be allowed to cross the JFK causeway or Harbor Bridge in high winds.
- Prepare to stay at your evacuation destination for a week or more, as reentry into the affected region may be restricted.



Evacuation Routes



Emergency Information

Emergency Management Agency Phone Numbers And Information

City of Corpus Christi

(361) 826-1100 www.cceoc.com

Nueces County

(361) 888-0513 (361) 826-2900

Port Aransas City Hall

(361) 749-4111 www.cityofportaransas.org

Kingsville Police Kleberg County

(361) 592-4311 (361) 595-8527

Rockport Police Aransas County

(361) 729-1111 (361) 729-2222

San Patricio County

(361) 364-6144

Ingleside Police

(361) 776-2531

Portland Police

(361) 643-2546

City of Alice EMC Jim Wells County

(361) 668-1018 (361) 668-0341

Live Oak County

(361) 449-2271

Bee County

(361) 362-3271 www.co.bee.tx.us

Refugio County

(361) 526-1698

City of Goliad Goliad County

(361) 645-1729 (361) 645-3451

U.S. Department of Homeland Security

www.ready.gov

National Red Cross

www.redcross.gov

FEMA

www.fema.gov

during/after storm

Returning Home

If you evacuated the area, wait for an all clear from the city/county before attempting to return to your home. Be prepared to show proof of residence by having a copy of your latest utility bill.

General

- Be cautious of structural damage and downed power lines. Do not attempt to move structural supports or large pieces of debris.
- Do not run power generators indoors. Inhalation of carbon monoxide from the exhaust may cause death. When operating power generators, ensure the exhaust is well ventilated.
- Do not use open flames indoors.
- Restrict your driving to emergency only as initial road conditions may be unsafe until road debris is able to be cleared.



30% of all deaths associated with a hurricane occur indirectly well after the storm has passed and cleanup is underway.

Debris:

- Cities/Counties will publish a schedule for debris pick-up and removal. Debris cannot be removed from private property.
- Construction materials, vegetative debris, household hazardous waste and household appliances will need to be placed into separate piles and moved to the curbside for pick-up.

Water:

- Listen for instructions regarding public water supply. Use only bottled, boiled or treated water until you know that your water supply is safe.
- You can use household chlorine bleach to treat water for drinking or cleaning. Add 1/8 teaspoon per gallon of clear water or 1/4 teaspoon per gallon if water is cloudy. Allow water to stand for 30 minutes before using.

Community Resource Information

2-1-1

DO NOT CALL 911 FOR NON-EMERGENCIES!!

Returning Home

Utilities:

- Check for gas leaks. If you smell or hear gas leaking, leave immediately. Do not use the phone or turn on lights in your home. Call the gas company from a neighbor's or a cell phone.
- Report any visible damage of power lines to the electric company. Turn off power at main breaker if any electrical equipment or circuits have been exposed to water.
- If you suspect water or sewage lines are damaged, do not use your plumbing (toilets, sinks, etc). Contact the water company or a plumber for repairs.

<u>Sewage</u>

- A chemical portable commode can be created:
 - Use 5 gallon buckets with tightly fitting lids, lined with heavy-duty plastic garbage bags.
 - Add kitty litter to the bucket as a disinfectant and deodorizer. Keep lids on firmly.
 - Keep buckets in a cool, dark place. Clean and disinfect the buckets immediately after use.
- Your toilet can also be used by flushing until the bowl has no water. Then, line with heavy-duty trash bags and disinfect with chlorine bleach after each use. When full, tie it shut and move it to an outside location.
- If significant sewer outages have occurred, instructions for disposal of human wastes will be announced.
- Do not dispose of human waste through your regular trash pickup!

<u>Clean Up</u>

- Disinfect and dry interior buildings and items in them. This will prevent growth of some bacteria, viruses, mold, and mildew that can cause illness.
- Clean walls, floors, and counter surfaces with soap and water. Disinfect them with a solution of 1 cup bleach to 5 gallons water.
- Wash all clothes and linen in hot water. Air dry and spray all un-washable items (i.e., mattresses or furniture) with disinfectant. Steam clean carpets. Throw away all items touched by water that cannot be disinfected.





Steve Jacobs Joe Gazin Dan McReynolds



MORE LOCAL NEWS













MORE LOCAL NEWS

HRIDERS IN STORY STORY THE STO



We strive to do what it takes to assist those in need during times of crisis.

CITGO employees volunteered countless hours to help our neighbors in the Gulf Coast region in the aftermath of two devastating hurricanes. CITGO pledged \$5 million in support for Hurricane Katrina survivors and reconstruction over time and more than \$100,000 has been paid out in employee and matching gift contributions to a variety of relief organizations.

Closer to home at the Corpus Christi Refinery, the CITGO Cares Team volunteers to assist non-profits in the area, including YMCA, Boys & Girls Club, Diabetes Walk, Tree for All, Junior Achievement, etc. CITGO remains among the largest corporate donors to United Way organizations in Corpus Christi.

